

VIReC Database & Methods Cyberseminar Series

Examining Veterans' Pharmacy Use with VA and Medicare Pharmacy Data

June 29, 2015

Presented by:

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Xinhua Zhao, PhD

Poll Question #1: I am interested in VA data primarily due to my role as _____.

- Research investigator
- Data manager
- Project coordinator
- Program specialist or analyst
- Other (specify)

Poll Question #2: Have you ever used VA Pharmacy Data?

- Yes
- No

Poll Question #3: How would you rate your overall knowledge of VA Pharmacy Data?

- 1 (Never Used)
- 2
- 3
- 4
- 5 (Used Frequently, Very familiar)

Session Objectives

- How has outpatient pharmacy data been used in VA studies?
- Overview of VA and Medicare pharmacy databases
- Finding information in the VA and Medicare pharmacy databases
- Examples of VA studies that have used the VA pharmacy databases
- Where to go for more help

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How has pharmacy data been used in VA studies?

Trends in Medication Use

Support Care Cancer (2012) 20:1649–1657
DOI 10.1007/s00520-011-1255-0

ORIGINAL ARTICLE

Trends in anemia management in lung and colon cancer patients in the US Department of Veterans Affairs, 2002–2008

Elizabeth Tarlov · Kevin T. Stroupe · Todd A. Lee · Thomas W. Weichle · Qiuying L. Zhang · Laura C. Michaelis · Howard Ozer · Margaret M. Browning · Denise M. Hynes

Received: 11 July 2011 / Accepted: 9 August 2011 / Published online: 20 September 2011
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Abstract

Purpose In 2007, growing concerns about adverse impacts of erythropoiesis-stimulating agents (ESAs) in cancer patients led to an FDA-mandated black box warning on product labeling, publication of revised clinical guidelines, and a Medicare coverage decision limiting ESA coverage. We examined ESA therapy in lung and colon cancer patients receiving chemotherapy in the VA from 2002 to 2008 to ascertain trends in and predictors of ESA use.

Methods A retrospective study employed national VA databases to “observe” treatment for a 12-month period following diagnosis. Multivariable logistic regression analyses evaluated changes in ESA use following the

FDA-mandated black box warning in March 2007 and examined trends in ESA administration between 2002 and 2008.

Results Among 17,014 lung and 4,225 colon cancer patients, those treated after the March 2007 FDA decision had 65% (lung OR 0.35, CI_{95%} 0.30–0.42) and 53% (colon OR 0.47, CI_{95%} 0.36–0.63) reduced odds of ESA treatment compared to those treated before. Declines in predicted probabilities of ESA use began in 2006. The magnitude of the declines differed across age groups among colon patients ($p=0.01$) and levels of hemoglobin among lung cancer patients ($p=0.04$).

Conclusions Use of ESA treatment for anemia in VA cancer care declined markedly after 2005, well before the 2007 changes in product labeling and clinical guidelines. This suggests that earlier dissemination of research results had marked impacts on practice patterns with these agents.

Keywords Lung neoplasms · Colon neoplasms · Anemia/ drug therapy · Physician's practice patterns · Age factors

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Introduction

- Tarlov E, Stroupe KT, et al. *Support Care Cancer*. 2012; 20: 1649–57
- Pharmacy data used to assess trends in medication use

How has pharmacy data been used in VA studies?

Cohort Identification

Arthritis Care & Research
Vol. 64, No. 10, October 2012, pp 1490–1496
DOI 10.1002/acr.21736
© 2012, American College of Rheumatology

ORIGINAL ARTICLE

Identification of Rheumatoid Arthritis Patients Using an Administrative Database: A Veterans Affairs Study

BERNARD NG,¹ FAWAD ASLAM,² NANCY J. PETERSEN,¹ HONG-JEN YU,³ AND MARIA E. SUAREZ-ALMAZOR¹

Objective. The accuracy of the diagnosis is vital when administrative databases are used for pharmacoepidemiologic and outcome studies. Data pertaining to the utility of databases for rheumatoid arthritis (RA) are sparse and variable. We assessed the utility of various diagnostic algorithms to identify RA patients within the Veterans Health Administration (VHA) databases.

Methods. Using the International Classification of Diseases, Ninth Revision code for RA at 2 visits at least 6 months apart, we identified 1,779 patients between October 1, 1998 and September 30, 2009 in our local Veterans Affairs Medical Center (VAMC) administrative database. Disease-modifying antirheumatic drug (DMARD) use was ascertained from the pharmacy database. Cases were analyzed based on DMARD therapy and RA codes at clinic visits. A total of 543 patients' medical records, selected by stratification and random selection on the basis of their visits, were reviewed to ascertain the clinicians' diagnoses and clinical criteria documentation. Positive predictive values (PPVs) were calculated for various database case identification algorithms using diagnosis of RA by medical record review as the gold standard.

Results. The PPV for identification of RA with 2 RA codes 6 months apart was 30.9%. Addition of DMARD therapy increased the PPV to 60.4%. The PPV further increased to 91.4% when having an RA code at the last VAMC rheumatology clinic visit criterion was added. An algorithm using only 2 administrative RA codes 6 months apart had a low PPV for correctly identifying patients with RA in the VHA database.

Conclusion. Including DMARD therapy and requiring an RA code at the last visit with a rheumatologist increased the performance of the data extraction algorithm.

INTRODUCTION

Computerized administrative databases are frequently used for epidemiologic research. The Veterans Health Administration (VHA) databases, among the largest in the country, are one such example. International Classification of Diseases, Ninth Revision (ICD-9), clinical modification codes are often used to identify subjects for research pur-

vidual patient records, the validity and reliability of using administrative codes as the sole source of patient identification have been debated. A few studies have been undertaken for rheumatic diseases including rheumatoid arthritis (RA), gout, and spondylarthritides (1–3). While the coding accuracy has been good for the latter, the same cannot be said for RA and gout. For RA in particular, the results have been mixed. A study by Singh et al identifying

- Ng B, et al. *Arthritis Care & Research*. 2012; 64: 1490–96
- Pharmacy data used for cohort identification

How has pharmacy data been used in VA studies?

Cohort identification and utilization

Research

Original Investigation | LESS IS MORE

Dual Use of Department of Veterans Affairs and Medicare Benefits and Use of Test Strips in Veterans With Type 2 Diabetes Mellitus

Walid F. Gellad, MD, MPH; Xinhua Zhao, PhD; Carolyn T. Thorpe, PhD, MPH; Maria K. Mor, PhD; Chester B. Good, MD, MPH; Michael J. Fine, MD, MSc

IMPORTANCE Self-monitoring of blood glucose is a costly component of care for diabetes mellitus, with unclear benefits for patients not taking insulin. Veterans with dual Department of Veterans Affairs (VA) and Medicare benefits have access to test strips through both systems, raising the potential for overuse.

OBJECTIVES To examine the patterns of test strip receipt among older veterans with diabetes and determine whether receipt of strips from dual health care systems is associated with overuse.

DESIGN, SETTING, AND PARTICIPANTS We performed a cross-sectional, retrospective cohort study using national VA administrative data linked to Medicare Parts A, B, and D claims for fiscal years 2008 and 2009. A total of 363 996 community-dwelling veterans 65 years or older with diabetes who used the VA health care system and received test strips in fiscal year 2009 were included in the study.

EXPOSURES Receipt of test strips from the VA only, Medicare only, or both the VA and Medicare; covariates included sociodemographics, comorbidity, diabetes complications, and hemoglobin A_{1c} level.

MAIN OUTCOMES AND MEASURES Quantity of test strips dispensed and overuse of test strips, defined as more than 1 strip per day (>365 strips per year) among those taking no diabetes medications, oral diabetes medications alone, or long-acting insulin without short-acting insulin or more than 4 strips per day (>1460 strips per year) among those taking short-acting insulin.

RESULTS Overall, 260 688 older veterans (71.6%) with diabetes received strips from the VA only, 82 826 (22.8%) from Medicare only, and 20 482 (5.6%) from the VA and Medicare. Veterans receiving strips from both the VA and Medicare received more strips (median, 600; interquartile range [IQR], 350-1000) than the Medicare only (median, 400; IQR, 200-700) and VA only (median, 200; IQR, 100-500) groups ($P < .001$) and had substantially greater odds of overuse than the VA only group (55.4% vs 15.8%) (adjusted odds ratio [OR], 16.3; 95% CI, 14.6-18.1 for no medications; 55.3% vs 6.0%; OR, 19.8; 95% CI, 18.9-20.8 for oral medications; 87.4% vs 65.5%; OR, 3.69; 95% CI, 3.30-4.14 for long-acting insulin; and 32.8% vs 13.5%; OR, 3.24; 95% CI, 3.05-3.45 for short-acting insulin). Patterns were similar when using more conservative thresholds of overuse.

CONCLUSIONS AND RELEVANCE Veterans who receive glucose test strips through both the VA

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- Gellad W, Zhao X, Thorpe C, et al. *JAMA Intern Med.* 2015; 175(1):26-34
- VA PBM and Medicare Part D data used for cohort identification and to assess the use of diabetes meds and test strips

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- **Overview of VA and Medicare pharmacy databases**
- Finding information in the VA and Medicare pharmacy databases
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Pharmacy Data Sources

- Local Databases
 - VistA, All VA pharmacy data are entered, processed, and stored in VistA
- National Data Sources
 - Pharmacy Benefit Management (PBM)
 - Decision Support System (DSS) National Data Extract (NDE) Pharmacy Datasets – now renamed as VA's Managerial Cost Accounting (MCA) System
 - Corporate Data Warehouse (CDW)
 - Medicare Part D events data from Part D Slim File

Pharmacy Data Sources

- Other Key Pharmacy Data Sources
 - DSS Product Table
 - National Drug File
- Note: These are summary data, not person-level files

Poll Question #4: Which national sources of pharmacy data have you used in the past?

- DSS NDE Pharmacy Data
- PBM Pharmacy Data
- CDW Pharmacy Data
- Part D Slim File
- None

VA Pharmacy Data Sources

- VA Pharmacy Benefits Management (PBM) Database
 - Outpatient data available from FY1999
 - Inpatient data available from FY2003
 - Source of pharmacy data is local VA facilities' VistA systems
 - Includes records for inpatient and outpatient prescriptions from VA pharmacies or Consolidated Mail Outpatient Pharmacy (CMOP)
 - Housed by PBM and available through custom extracts

VA Pharmacy Data Sources

VA Outpatient PBM file key variables include:

Variable	Meaning	Example data
Va_product	VA Product	DICLOFENAC NA 50MG TAB,EC
Va_class	VA Class	MS102 NONSALICYLATE NSAIs,ANTIRHEUMATIC
generic	Generic name	DICLOFENAC
Sig	Directions of use	TAKE 1 50 MG TABLET ORAL BID TO RELIEVE PAIN
Dsp_unt	Dispensing Unit	TAB
Day_supply	Day of Supply	21
Tl_qty	Total quantity	42
Price_dsp	Price per Dispensing Unit	0.151
Tl_cost	Total Drug Cost	6.342
rel_date	Release date	1/1/2015
NDC	National Drug Code	00228-2550-11
CMOP_IND	CMOP indicator	Y

VA Pharmacy Data Sources

- DSS (currently MCA) NDE Pharmacy Datasets
 - Data available from FY2005
 - Includes records for inpatient and outpatient prescriptions from VA pharmacies or Consolidated Mail Outpatient Pharmacy (CMOP)
 - Source of pharmacy data is the local VA facilities' VistA systems
 - Housed at Corporate Data Warehouse (CDW) from FY2005 and available through custom extracts

VA Pharmacy Data Sources

- CDW Pharmacy Data
 - Data available from FY 2000
 - Source of pharmacy data is VistA
 - CDW has two pharmacy production domains
 - Outpatient Pharmacy
 - Bar Code Medication Administration (BCMA)

VA Pharmacy Data Sources

Select CDW Outpatient Pharmacy Tables

- CDW Outpatient Pharmacy Fact tables (RxOut)
 - RxOutPat Prescriptions
 - RxOutPat Fill
 - RxOutPat Sig
 - RxOutPat Medication Instructions
- CDW Outpatient Pharmacy dimension tables (dim)
 - DosageForm
 - DrugClass
 - LocalDrug
 - NationalDrug
 - DrugNameWithoutDose
 - PharmacySite

The 4 RxOut tables link by RX-level Primary key
[RxOutpatSID](#)

The 6 Dim Tables link to RxOut tables by each Dim-table specific primary key, such as
[DosageFormSID](#)
[DrugClassSID](#)

VA Pharmacy Data Sources

Data contents and sample records: <http://vaww.virec.research.va.gov/CDW/Documentation.htm>

VA INFORMATION RESOURCE CENTER (VIREC)

[VIREC Home](#)

[VA/CMS Home](#)

[About Us](#)

[New Users of VA Data](#)

[FAQs](#)

[Acronyms](#)

[HelpDesk](#)

CDW Documentation

Overview

VIREC documentation for the Corporate Data Warehouse (CDW) includes domain layouts, data contents, sample records, and frequencies. This summary information is available by domain or schema.

This web page provides access to the most recent version of our CDW documentation. Previous versions are available upon request by contacting the VIREC [HelpDesk](#).

New! Factbooks

Descriptions of tables, columns, and values in select CDW Domains. Includes domain-specific SQL "starter language" for those new to CDW, relational databases, and SQL.

VIREC Factbook: Corporate Data Warehouse (CDW) [Inpatient 2.1 Domain \(Part I - Inpatient\), Version 2](#)
Released: June 2015

VIREC Factbook: Corporate Data Warehouse (CDW) [Mental Health 1.0 Domain](#)
Released: November 2014

VIREC Factbook: Corporate Data Warehouse (CDW) [Consult 2.1 Domain](#)
Released: October 2014

VIREC Factbook: Corporate Data Warehouse (CDW) [Consult 2.0 Domain](#)
Released: September 2014

Domain Layout

A list of schemas and tables for each CDW domain.

[View Domain Layout](#)

Data Contents

A list of data elements for each CDW domain.

[View Data Contents](#)

Sample Records

Randomly selected records for each CDW domain.

[View Sample Records](#)

CDW

- [Overview](#)
- [Data Transition to CDW](#)
- [Documentation](#)

General Resources

- [Data Access](#)
- [Data Sources](#)
- [Data Tools](#)
- [Data Topics](#)
- [Products & Services](#)
- [Special Projects](#)

Comparison of VA Pharmacy Data Sources

	PBM	DSS	CDW
Data Availability	FY1999(Outpatient) FY2003(Inpatient)	FY2005(Outpatient &Inpatient)	FY2000
Cost Data	Drug product total cost Unit Price Patient payment	Drug product total cost (ACT_COST) Dispensing labor cost (DISPCOST) Variable Supply cost (VS_COST)	Unit price
Directions for use	SIG available(also components of SIG available: SCHED, UNT_DOSE, DSP_UNT)	Not available, do not contain dosing instruction or dispensing unit	SIG available
NDC	YES	YES (contained in field FEED_KEY)	YES

Comparison of VA Pharmacy Data Sources (cont.)

- **Data Comparability:** VIReC compared DSS and PBM data sources on outpatient prescriptions for a cohort, and found that nearly all of the same prescriptions appeared in both files, with a discrepancy rate of only 1.5%.

Reference: VIReC Research User Guide: VHA Pharmacy Prescription Data, 2nd Edition

<http://vaww.virec.research.va.gov/RUGs/Pharmacy/RUG-Pharmacy-2nd-Ed-CY08-RA.pdf>

Medicare Part D

- In 2012, 40% of VHA/Medicare enrolled Veterans are enrolled in Medicare Part D
- Different than Medicare Parts A & B
 - Claims for drugs are paid for by insurance companies, not the Center for Medicare & Medicaid Services (CMS)
 - Insurance companies submit data to CMS on all prescriptions filled
- Data for research use
 - Prescription Drug Event File(PDE)
 - Characteristics File: Plan, Formulary, Pharmacy, Prescriber
 - Slim File is subset of PDE data

Website of VA/CMS repository Data: <http://vaww.virec.research.va.gov/VACMS/Intro/Repository-Data.htm>

Medicare Part D

- Medicare Part D enrollment status in Medicare Enrollment Files
- Important Variables in Medicare Enrollment Files include
 - Number of months of Part D coverage
 - Type of Part D plan (e.g., Managed care plan, prescription drug plan [PDP])
- 13 variables from Medicare Prescription Drug Event (PDE) data are available in Part D Slim File
- Part D Slim File Data are available from VIReC as custom extracts
- Data are available from CY 2006, currently 2006-2011 files are available

Medicare Part D

- Medicare Part D Slim File key variables include:

Variable Name	Meaning	Example data
SRVC_DT	Service date	3-Jul-07
PROD_SRVC_ID	National Drug Code (NDC)	00071015623
QTY_DSPNSD_NUM	Quantity dispensed	30
DAYS_SUPLY_NUM	Days Supply	30
PTNT_PAY_AMT	Patient Payment	29
TOT_RX_CST_AMT	Gross drug Cost	111.11
BN	Brand Name	LIPITOR
GCDF (dosage form)	Dosage form	TA
STR	Drug Strength	20MG
GNN	Generic Name	ATORVASTATIN CALCIUM

Other Pharmacy Data

- DSS Product Table
 - Key Variables
 - IPNum, Feeder Key, Description (short and long), Drug Class
 - Feeder Key => 1st 5 characters are VA product file IEN; last 12 characters are NDC
 - Available on DSS Intranet website
- National Drug File
 - Key Variables
 - VA_PRODUCT, FEEDER KEY, NDF_NDC, VA_CLASS
 - Available on PBM Intranet website
- Note: These are not person-level files

Session Objectives

- How has outpatient pharmacy data been used in VA studies?
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Assessing Outpatient Pharmacy Use: Finding info in VA and Part D Pharmacy Datasets

How to search for medications of interest

1. By drug generic names or medication class (not available in Part D Slim file)
2. By National Drug Code (NDC). You can use Medi-Span or other databases to obtain the NDC codes

Assessing Outpatient Pharmacy Use: NDC codes

- The NDC is a unique 10 or 11-digit, 3-segment (4/5-4-2) number, identifying the labeler, the product, and the commercial package size.
- For example, the 10-digit NDC for a 100-count bottle of Prozac 20 mg is 0777-3105-02



- VA PBM , DSS NDEs, Part-D all give 11-digit NDC

Assessing Outpatient Pharmacy Use: Finding info in VA Pharmacy Datasets

Where can I find cost variables?

- DSS and PBM contain different cost variables
 - PBM: cost of the drug product from the supplier
 - DSS:
 - 1) **Dispensing Cost (DISPCOST)**: direct pharmacist labor for dispensing the prescription and the mailing costs
 - 2) **Supply Cost (VS_COST)**: cost of supplies used in preparing the prescription, such as bottles and labels
 - 3) **Actual Cost (ACT_COST)**: Drug product cost, cost of supplies such as bottles and labels to prepare the prescription, indirect costs, and overhead

Assessing Outpatient Pharmacy Use: Finding info in VA Pharmacy Datasets

Where can I find cost variables? (Cont.)

- Part D Slim File

- 1) **Patient Pay Amount (PTNT_PAY_AMT):** Amount patient pays for medication
- 2) **Gross Drug Cost (TOT_RX_CST_AMT):**
This variable is derived from the sum of Ingredient Cost Paid, Dispensing Fee Paid, Total Amount Attributed to Sales Tax, Vaccine Administration Fee

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Assessing Outpatient Pharmacy Use: Examples of Questions Addressed with Pharmacy Data

- Cohort identification
 - *Can pharmacy data be used to identify specific groups of patients?*
- Medication utilization
 - *Does a policy change impact medication use?*
- Healthcare quality
 - *Are patients being prescribed medications in accordance with quality measures?*
- Medication adherence
 - *How much of a prescribed medication are patients using?*
- Exposure to specific medications or medication classes
 - *Are specific drugs associated with better/worse outcomes?*
- Combining outpatient and pharmacy data to identify events
 - *Can we identify acute exacerbations of COPD with outpatient and prescription data?*
- Assessing comorbidity or case-mix with medication data

How has pharmacy data been used in VA studies?

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FDA-mandated black box warning in March 2007 and examined trends in ESA administration between 2002 and 2008.

Results Among 17,014 lung and 4,225 colon cancer patients, those treated after the March 2007 FDA decision had 65% (lung OR 0.35, CI_{95%} 0.30–0.42) and 53% (colon OR 0.47, CI_{95%} 0.36–0.63) reduced odds of ESA treatment compared to those treated before. Declines in predicted probabilities of ESA use began in 2006. The magnitude of the declines differed across age groups among colon patients ($p=0.01$) and levels of hemoglobin among lung cancer patients ($p=0.04$).

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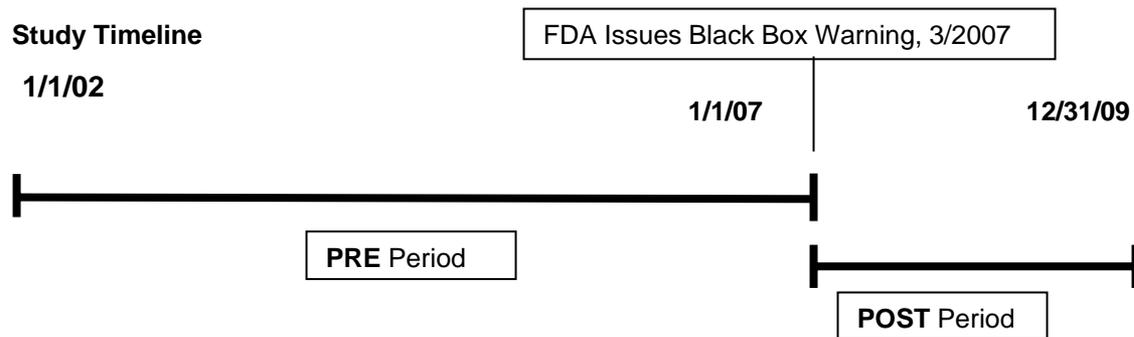
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Maywood, IL, USA

Introduction

- Tarlov E, Stroupe KT, et al. Support Care Cancer. 2012; 20:1649–57
- Objective: To examine erythropoiesis-stimulating agent (ESA) therapy in lung and colon cancer patients receiving chemotherapy from 2002 to 2008

Trends in Medication Use: Tarlov et al. Support Care Cancer. 2012



- How was pharmacy data used?
 - Pharmacy data was used to examine
 - Whether ESA use differed before (PRE) or after (POST) the black box warning
 - Trends in ESA use over time

Trends in Medication Use: Tarlov et al. Support Care Cancer. 2012

- Source of pharmacy data
 - PBM Database was used to identify ESA use
- How were ESAs identified in the PBM Database?
 - NDCs were used to identify the ESAs in the PBM database

Trends in Medication Use:

Tarlov et al. Support Care Cancer. 2012

Table 2 Odds of receiving ESA treatment

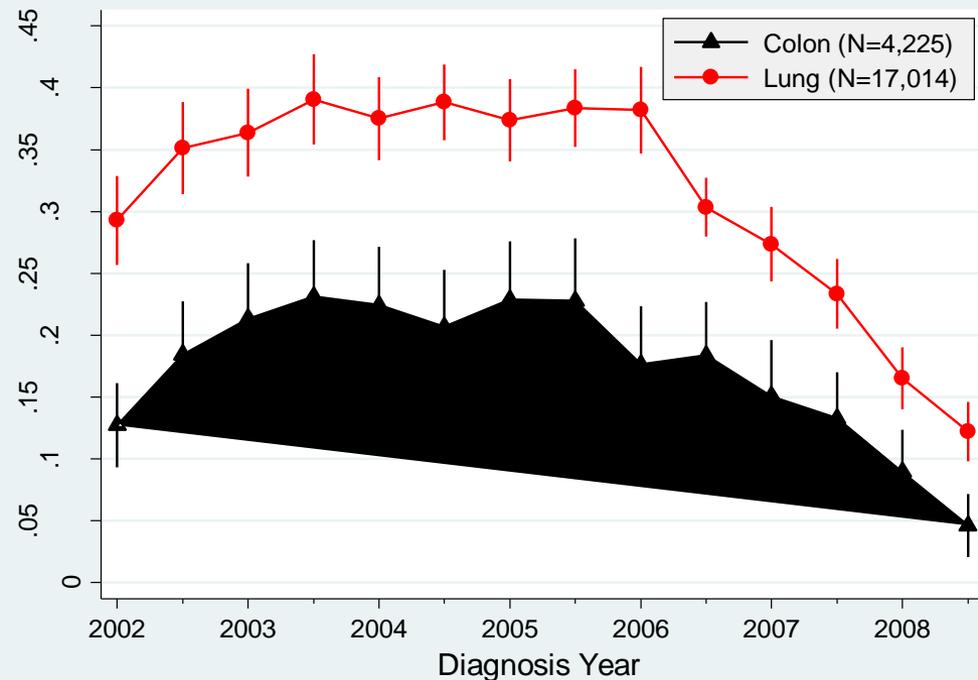
	Adjusted odds ratios ^a (95% confidence limits)	
	Lung cancer (N=17,014)	Colon cancer (N=4,225)
Time period ^b		
PRE	Ref	Ref
POST	0.35 (0.30–0.42)	0.47 (0.36–0.63)

^aOdds ratios obtained from a logistic regression model.

^bPRE/POST time periods defined in relation to March 1, 2007

- For lung cancer patients
 - Odds of ESA use decreased 65% in the POST period
- For colon cancer patients
 - Odds of ESA use decreased 53% in the POST period

Trends in Medication Use: Tarlov et al. Support Care Cancer. 2012



- ESA use began to decline for both cancer groups before black box warning was issued

How has pharmacy data been used in VA studies? Cohort Identification

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- Ng B, et al., *Arthritis Care Research*. 2012; 64:1490–96
- Objective: To assess the utility of diagnostic algorithms, including prescriptions, to identify rheumatoid arthritis patients within VHA databases

Cohort Identification:

Ng et al. Arthritis Care Research. 2012

- Study sample consisted of patients having 2 outpatient visits with rheumatoid arthritis (RA) codes at least 2 months apart at Houston VAMC between FY99 and FY09
- Study tested algorithms to identify RA through VHA databases using
 - Presence of at least 2 ICD-9 at least 6 months apart
 - Use of disease-modifying anti-rheumatic drugs (DMARD) for at least 180 days
 - ICD-9 code for RA at visit to rheumatologist

Cohort Identification:

Ng et al. *Arthritis Care Research*. 2012

- Study design
 - To validate diagnosis of RA, study conducted chart review
 - Study evaluated the positive predictive value (PPV) of the diagnostic algorithms using validation from chart review
- Source of Pharmacy Data
 - PBM Database

Cohort Identification:

Ng et al. *Arthritis Care Research*. 2012

Table 2. Total population number and sample statistics: PPV, sensitivity, and specificity of different algorithms for random sample of patients with at least 2 RA codes*

	Total population, no.	Estimated no. of RA patients (PPV from random sample × total population)	Random sample statistics, % (95% CI)		
			PPV	Sensitivity	Specificity
All patients (with or without DMARD therapy for ≥180 days)					
Two RA codes (any visit)	1,779	550	30.9 (27.7–34.2)	NA†	NA†
Two RA codes with at least 1 RA code in a rheumatologist visit	1,014	408	40.2 (34.1–46.3)	47.6 (41.4–53.8)	68.3 (62.5–74.1)
Two RA codes with at least 1 rheumatology visit and with the last rheumatologist visit with an RA code	541	364	67.3 (58.9–75.8)	39.3 (30.5–48.0)	91.5 (86.5–96.5)
Patients with DMARD therapy for ≥180 days					
Two RA codes (any visit)	791	478	60.4 (55.3–65.5)	88.1 (84.7–91.5)	74.1 (69.6–78.7)
Two RA codes with at least 1 RA code in a rheumatologist visit	621	466	75.0 (67.2–82.8)	44.6 (35.7–53.6)	93.3 (88.9–97.8)
Two RA codes with at least 1 rheumatology visit and with the last rheumatologist visit with an RA code	430	393	91.4 (85.4–97.4)	38.1 (27.7–48.5)	98.4 (95.7–100.0)

* PPV = positive predictive value; RA = rheumatoid arthritis; 95% CI = 95% confidence interval; DMARD = disease-modifying antirheumatic drug; NA = not applicable.
† Sensitivity and specificity cannot be estimated for all.

How has pharmacy data been used in VA studies?

Cohort identification and utilization

Research

Original Investigation | LESS IS MORE

Dual Use of Department of Veterans Affairs and Medicare Benefits and Use of Test Strips in Veterans With Type 2 Diabetes Mellitus

Walid F. Gellad, MD, MPH; Xinhua Zhao, PhD; Carolyn T. Thorpe, PhD, MPH; Maria K. Mor, PhD; Chester B. Good, MD, MPH; Michael J. Fine, MD, MSc

IMPORTANCE Self-monitoring of blood glucose is a costly component of care for diabetes mellitus, with unclear benefits for patients not taking insulin. Veterans with dual Department of Veterans Affairs (VA) and Medicare benefits have access to test strips through both systems, raising the potential for overuse.

OBJECTIVES To examine the patterns of test strip receipt among older veterans with diabetes and determine whether receipt of strips from dual health care systems is associated with overuse.

DESIGN, SETTING, AND PARTICIPANTS We performed a cross-sectional, retrospective cohort study using national VA administrative data linked to Medicare Parts A, B, and D claims for fiscal years 2008 and 2009. A total of 363 996 community-dwelling veterans 65 years or older with diabetes who used the VA health care system and received test strips in fiscal year 2009 were included in the study.

EXPOSURES Receipt of test strips from the VA only, Medicare only, or both the VA and Medicare; covariates included sociodemographics, comorbidity, diabetes complications, and hemoglobin A_{1c} level.

MAIN OUTCOMES AND MEASURES Quantity of test strips dispensed and overuse of test strips, defined as more than 1 strip per day (>365 strips per year) among those taking no diabetes medications, oral diabetes medications alone, or long-acting insulin without short-acting insulin or more than 4 strips per day (>1460 strips per year) among those taking short-acting insulin.

RESULTS Overall, 260 688 older veterans (71.6%) with diabetes received strips from the VA only, 82 826 (22.8%) from Medicare only, and 20 482 (5.6%) from the VA and Medicare. Veterans receiving strips from both the VA and Medicare received more strips (median, 600; interquartile range [IQR], 350-1000) than the Medicare only (median, 400; IQR, 200-700) and VA only (median, 200; IQR, 100-500) groups ($P < .001$) and had substantially greater odds of overuse than the VA only group (55.4% vs 15.8%) (adjusted odds ratio [OR], 16.3; 95% CI, 14.6-18.1 for no medications; 55.3% vs 6.0%; OR, 19.8; 95% CI, 18.9-20.8 for oral medications; 87.4% vs 65.5%; OR, 3.69; 95% CI, 3.30-4.14 for long-acting insulin; and 32.8% vs 13.5%; OR, 3.24; 95% CI, 3.05-3.45 for short-acting insulin). Patterns were similar when using more conservative thresholds of overuse.

CONCLUSIONS AND RELEVANCE Veterans who receive glucose test strips through both the VA

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- Gellad W, Zhao X, Thorpe C, et al. *JAMA Intern Med.* 2015; 175(1):26-34
- Objective: To examine the patterns of test strip receipt among older Veterans with diabetes and determine whether receiving strips from dual health systems is associated with overuse

Dual Use of Test Strips

Gellad W, Zhao X, Thorpe C, et al. *JAMA Intern Med.* 2015

- **Design:** Cross-sectional, retrospective cohort.
- **Setting:** National VA administrative data linked to Medicare Parts A, B & D claims, fiscal years (FY) 2008-2009.
- **Participants:** 363,996 community-dwelling Veterans age ≥ 65 with diabetes who used the VA Healthcare System and received test strips, FY 2009.
- **Source of Pharmacy Data:** VA PBM Data and Part D files

Dual Use of Test Strips

Gellad W, Zhao X, Thorpe C, et al. *JAMA Intern Med.* 2015

How was pharmacy data used?

1. Use PBM Data to search diabetes meds by VA drug class and generic names combined with diagnosis codes from MedSAS to define the study cohort of Type II diabetes patients
2. Use PBM data AND Part D files (CY2008 and CY2009) to classify patients based on type of diabetes medications. For Part D medication search, we used NDC codes that we obtained from Medi-Span

Dual Use of Test Strips

Gellad W, Zhao X, Thorpe C, et al. *JAMA Intern Med.* 2015

How was pharmacy data used (continued)?

3. Use PBM data to search for and quantify test strips
4. Use Medicare DME files to search for and quantify test strips in Medicare (Medicare test strips are not in Part D data, instead, DME (Durable Medical Equipment supplies))

Dual Use of Test Strips

Gellad W, Zhao X, Thorpe C, et al. *JAMA Intern Med.* 2015

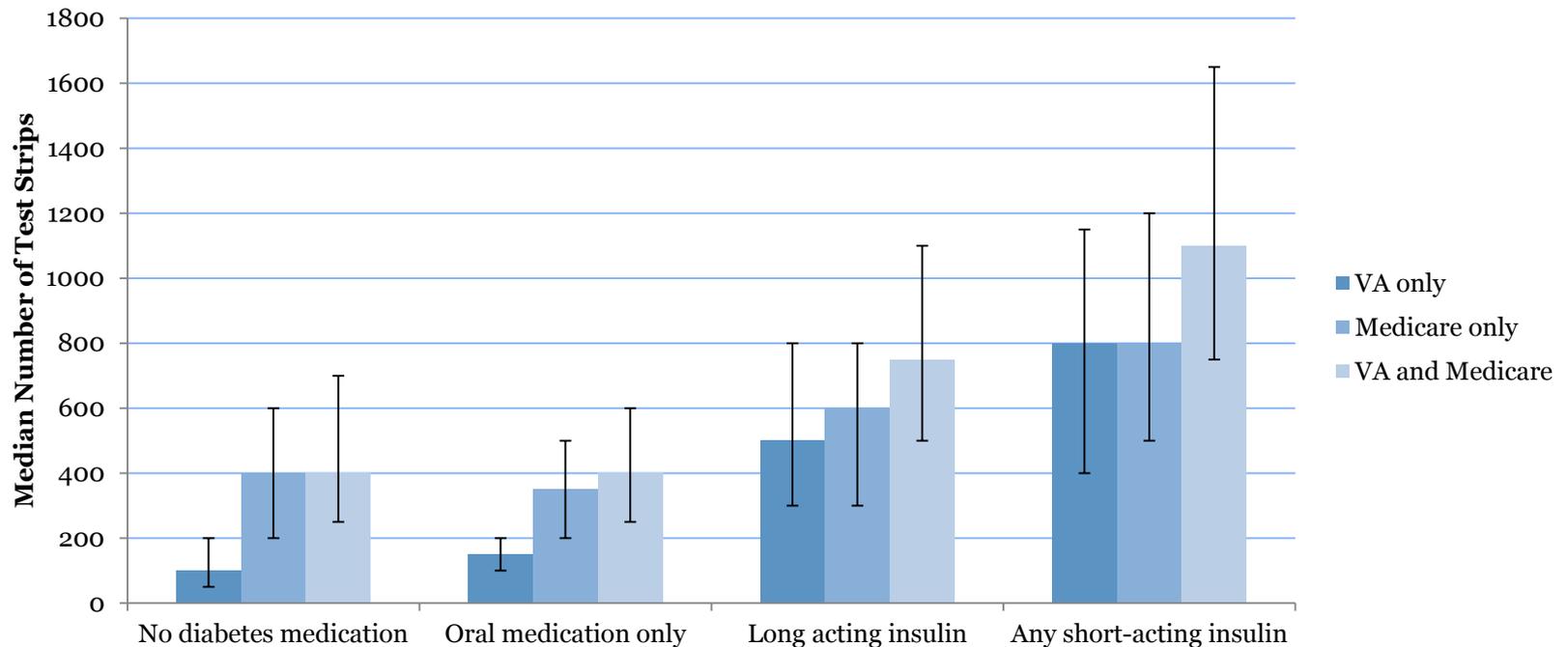
The study found that

- Overall, 260 688 older veterans (71.6%) with diabetes received strips from the VA only, 82 826 (22.8%) from Medicare only, and 20 482 (5.6%) from *both* the VA and Medicare.

Dual Use of Test Strips

Gellad W, Zhao X, Thorpe C, et al. *JAMA Intern Med.* 2015

Quantity of test strips received by Veterans age 65+ with diabetes by source of strips, categorized by type of diabetes medication use

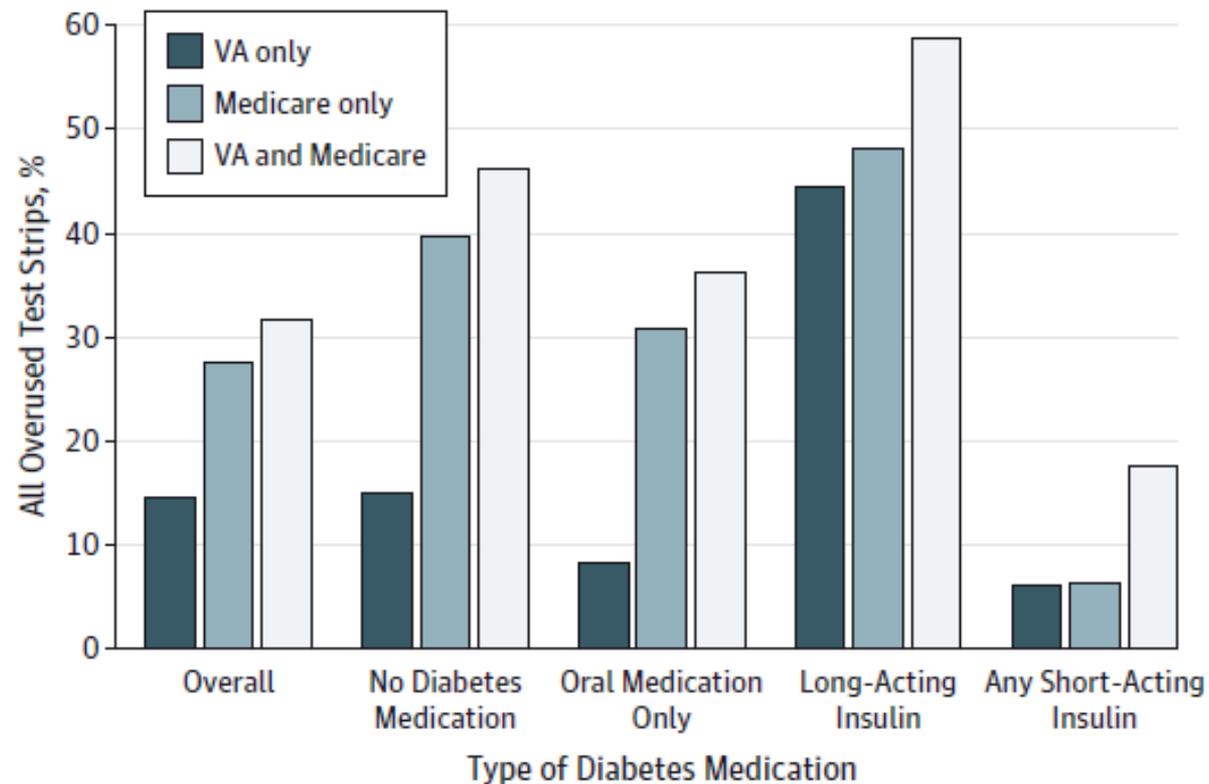


The bars represent the median number of strips dispensed, and the black lines represent interquartile ranges.

Dual Use of Test Strips

Gellad W, Zhao X, Thorpe C, et al. *JAMA Intern Med.* 2015

Figure 2. Percentage of All Glucose Test Strips That Are Dispensed in Excess to Veterans 65 Years or Older With Diabetes Mellitus by Source of Test Strip Receipt



Session Objectives

- How has outpatient pharmacy utilization been measured in VA studies?
- Overview of VA and Medicare pharmacy databases
- Finding information in the VA and Medicare pharmacy databases
- Examples of VA studies that have used the VA Pharmacy databases
- **Where to go for more help**

VIReC Help

- VA/CMS Website
 - <http://vaww.virec.research.va.gov/Index-VACMS.htm>
- VIReC Webpage
 - <http://vaww.virec.research.va.gov/Pharmacy/Overview.htm>
 - Information on VA pharmacy sources
 - Resource users guide for pharmacy data
 - <http://vaww.virec.research.va.gov/RUGs/Pharmacy/RUG-Pharmacy-2nd-Ed-CYo8-RA.pdf>

VIReC Help (cont'd)

- HSRData Listserv
 - Join at the VIReC Web site
 - Discussion among >1100 data stewards, managers, and users
 - Past messages in archive (on intranet)
- VIReC HelpDesk
 - VIReC staff will answer your question and/or direct you to available resources on topics
 - VIReC@va.gov
 - (708) 202-2413

Questions?

Selected Recent References on VA Outpatient Pharmacy Use

- Berlowitz, D. R. & Pugh, M. J. (2007). Pharmacoepidemiology in community-dwelling elderly taking antiepileptic drugs. *Int Rev Neurobiol.*, 81:153-63., 153-163.
- Damush, T. M. et al. (2008). Case-finding algorithm for post-stroke depression in the veterans health administration. *Int J Geriatr Psychiatry.*, 23, 517-522.
- Davis, R. G., Hepfinger, C. A., Sauer, K. A., & Wilhardt, M. S. (2007). Retrospective evaluation of medication appropriateness and clinical pharmacist drug therapy recommendations for home-based primary care veterans. *Am J Geriatr Pharmacother.*, 5, 40-47.
- Frayne, S. M., Yu, W., Yano, E. M., Ananth, L., Iqbal, S., Thrailkill, A. et al. (2007). Gender and use of care: planning for tomorrow's Veterans Health Administration. *J Womens Health (Larchmt.)*, 16, 1188-1199.
- Gellad WF et al. Use of Antipsychotics Among Older Residents in VA Nursing Homes. *Med Care.* 2012;50: 954–960.
- Gellad WF, Zhao X et al. Dual use of Department of Veterans Affairs and medicare benefits and use of test strips in veterans with type 2 diabetes mellitus. *JAMA Intern Med.* 2015;175(1):26-34.
- Huetsch JC, Uman JE, Udriș EM, Au DH. Predictors of Adherence to Inhaled Medications Among Veterans with COPD. *J Gen Intern Med.* 2010; 27(11):1506–12.

Selected Recent References on VA Outpatient Pharmacy Use (cont)

- Iqbal, S. U., Cunningham, F., Lee, A., Wang, S., Hamed, A., Miller, D. R. et al. (2007). Divalproex sodium vs. valproic acid: drug utilization patterns, persistence rates and predictors of hospitalization among VA patients diagnosed with bipolar disorder. *J Clin Pharm Ther.*, 32, 625-632.
- Jia, H., Damush, T. M., Qin, H., Ried, L. D., Wang, X., Young, L. J. et al. (2006). The impact of poststroke depression on healthcare use by veterans with acute stroke. *Stroke.*, 37, 2796-2801.
- Lee, T. A., Pickard, A. S., Au, D. H., Bartle, B., & Weiss, K. B. (2008). Risk for death associated with medications for recently diagnosed chronic obstructive pulmonary disease. *Ann Intern Med.*, 149, 380-390.
- Mahmood, M., Malone, D. C., Skrepnek, G. H., Abarca, J., Armstrong, E. P., Murphy, J. E. et al. (2007). Potential drug-drug interactions within Veterans Affairs medical centers. *Am J Health Syst Pharm.*, 64, 1500-1505.
- Mortensen, E. M., Restrepo, M. I., Copeland, L. A., Pugh, J. A., Anzueto, A., Cornell, J. E. et al. (2007). Impact of previous statin and angiotensin II receptor blocker use on mortality in patients hospitalized with sepsis. *Pharmacotherapy.*, 27, 1619-1626.

Selected Recent References on VA Outpatient Pharmacy Use (cont)

- Ng B, Aslam F, Petersen NJ, Yu HJ, Suarez-Almazor ME. Identification of Rheumatoid Arthritis Patients Using an Administrative Database: A Veterans Affairs Study. *Arthritis Care & Research*. 2012; 64:1490–1496.
- Prentice JC et al. Capitalizing on prescribing pattern variation to compare medications for type 2 diabetes. *Value Health*. 2014;17(8):854-62.
- Pugh MJV, Copeland LA, Zeber JE, et al. Antiepileptic drug monotherapy exposure and suicide-related behavior in older Veterans. *J Am Geriatr Soc*. 2012 Nov;60(11):2042-7.
- Sernyak, M. J. & Rosenheck, R. A. (2008). Antipsychotic use in the treatment of outpatients with schizophrenia in the VA from fiscal years 1999 to 2006. *Psychiatr Serv.*, 59, 567-569.
- Tarlov E, Stroupe KT, et al. Trends in anemia management in lung and colon cancer patients in the US Department of Veterans Affairs, 2002-2008. *Support Care Cancer*. 2012; 20:1649–1657
- VIREC Technical Report: Comparison of VA Outpatient Prescriptions in the DSS Datasets and the PBM Database
<http://vaww.virec.research.va.gov/References/TechnicalReports/VIRECTechnicalReport1.pdf>.
- Walbrown, M. A., Aspinall, S. L., Bayliss, N. K., Stone, R. A., Cunningham, F., Squier, C. L. et al. (2008). Evaluation of Clostridium difficile-associated diarrhea with a drug formulary change in preferred fluoroquinolones. *J Manag Care Pharm.*, 14, 34-40.